AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [0009] with the following amended paragraph:

[0009] The present invention provides systems and methods that facilitate the manifestation of a true time delay in a transmitted signal *via* [[a]] employing a continuously variable optical delay line in connection with the transmission of the signal. The systems and methods utilize a novel delay line that includes a hollow core holey fiber, a reflective fluid and a segmented piezoelectric device, wherein the piezoelectric device utilizes a commutated technique to position the reflective fluid in the holey fiber in a continuous, rather than a discrete, manner. The position of the reflective fluid within the fiber determines the effective length of the holey fiber, which is indicative of the delay that can be introduced to the signal.

Please replace paragraph [0015] with the following amended paragraph:

[0015] In another aspect of the present invention, a layered architecture is provided that can be employed to construct an optical delay line. The layered architecture comprises an optical delay line layer comprising a hollow core holey fiber, a reflective fluid reservoir and an input port. The optical delay layer is operative to a ~~delay adjusting~~ delay-adjusting layer that facilitates propagation of a reflective fluid from the reservoir through the holey fiber *via* temperature and/or pressure. By positioning the reflective fluid within the holey fiber in a continuous manner, the effective length of the holey fiber can be variably adjusted to set a delay that will be introduced to a received signal. The continuous nature of the change in delay mitigates loss of photons, which is indicative of techniques employing discrete changes, or delay steps. The input port provides for accepting the signal, and subsequently transmitting the delayed signal.

Please replace paragraph [0017] with the following amended paragraph:

[0017] The holey ~~fiver~~ fiber layer typically comprises a holey fiber, a delay reservoir, an overflow reservoir, and a port. The holey fiber can comprises an air core and typically is

orientated in a spiral layout, wherein one end is operative to the delay reservoir and the other end is operative to the port and overflow reservoir. The delay reservoir typically includes optically reflective fluid that can be forced to various locations in the holey fiber to set the delay *via* pressure and/or temperature in a continuous manner. In one example, a segmented piezoelectric actuator employing a commutated technique is utilized to force the reflective fluid through the holey fiber. The overflow reservoir mitigates loss and contamination of the reflective fluid. A signal is provided to the holey fiber at an angle of incidence to achieve total internal reflection, which mitigates signal loss through transmission and refraction through the cladding. After being input into the holey fiber, the optical signal traverses the spiral towards the delay reservoir, and then is reflected back to the input [[after]] by the surface of the reflective fluid.

Please replace paragraph [0018] with the following amended paragraph:

[0018] In ~~other~~ <u>another</u> aspect of the present invention, methodologies are illustrated that provide for a continuously variable delay line, in accordance with an aspect of the present invention. In addition, an exemplary environment employing the systems and methods of the present invention is depicted. The foregoing systems and methods provide for a novel inexpensive, compact and rugged solution that can improve communications *via* an extremely high and continuously tunable time-bandwidth, with virtually no information loss, that can be accurately referenced to a wavelength to achieve a very stable and accurate delay.

Please replace paragraph [0066] with the following amended paragraph:

[0066] When employing the continuously variable delay line ~~can be employed~~ at the transmitter 1110, an RF signal can be converted to an optical signal or an optical signal can be generated from an optical transmitter. In general, optical transmitters can be delineated into two groups - light emitting diodes (LEDs) and lasers. LEDs are more commonly employed in shorter distance applications and are lower in cost and provide efficient solutions. When high power is required for extended distances, ~~lasers typically~~ <u>lasers are typically</u> utilized. Lasers provide coherent light and the ability to produce a lot of light energy. Power typically is expressed in

terms of dBm, wherein multiple mode transmitters commonly employ signals with power about -15dBm and single mode transmitters employ a wide power range, depending on the application.

Please replace paragraph [0069] with the following amended paragraph:

[0069] The receiver sensitivity and the transmitter power commonly are employed to calculate the optical power budget available, which can be expressed as: Power Budget = Transmitter Power - Receiver Sensitivity. For example, the power budget for a typical multi-mode application would be: 15dBm = -15dBm - (-30dBm). The optical power budget should be greater ~~then the~~ than all of the losses such as attenuation, losses due to splices and connectors, *etc.* Suitable connector styles include SC connectors (recently standardized by ANSI TIA/EIA-568A), ST connectors, and MIC (duplex) connectors. MIC Connectors are physically larger then SC connectors, and are more commonly employed with FDDI.

Please replace paragraph [0070] with the following amended paragraph:

[0070] The optical signal can then be routed through the continuously variable delay line, wherein the signal can be suitable delayed, as described above. Then, [[the]] depending on the transmission, the delayed optical signal can be transmitted or the signal can be converted to an RF signal and transmitted. It is to be appreciated that techniques similar to the foregoing can be employed at the first and second receivers 1120, 1130. For example, the receivers 1120, 1130 can receive an RF signal, convert the signal to an optical signal, route the optical signal to a continuously variable delay line, convert the delayed optical signal to an RF signal, and transmit the RF signal. In another, the receivers 1120, 1130 can receive an optical signal, wherein the converters are not employed.